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and Decision Making

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**13. SUPPLEMENTARY NOTES****14. ABSTRACT**

This project equipped an existing opto-mechanical planetarium with new multimedia technology derived from flight simulation systems. This upgrade allowed for fully interactive and immersive programming to be projected onto the planetarium's dome screen. Additionally, the planetarium was equipped with a wireless polling and control system allowing for audience participation, feedback and content evaluation.

Using this technology, audience members have been presented a variety of show content in both real-time rendered and pre-recorded formats. Data has been collected from audiences on this content and collated for content retention, statistical analysis, and audience demographics. Additionally, portions of this data have been cross referenced with data collected via traditional evaluation methodology.

Finally, the new system technology has been leveraged as a content creation system for multimedia assets used in areas external to the planetarium.

**15. SUBJECT TERMS****16. SECURITY CLASSIFICATION OF:****a. REPORT**

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**b. ABSTRACT**

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**March 31, 2008**

**Final Report to AFOSR  
from Chabot Space & Science Center  
10000 Skyline Blvd Oakland, CA 94619**

Project Title: Investigating Immersive Environments as a Tool for Education and Decision Making

Principle Investigator: Alex Hall

Agreement Number: FA9550-04-1-0237

**20101110212**

**Chabot Space & Science Center  
Final Performance Report  
Award No. FA9550-04-1-0237**

**Technical Summary of Work Accomplished**

**Pre-existing Planetarium System**

- 1) Opto-mechanical System
  - a. 21.3m 16 degree tilt Astro-Tec dome- installed 2000
  - b. unidirectional seating
  - c. 240 seat capacity
  - d. 6 channel discreet surround sound
  - e. 40 Kodak Ektagraphic IIIe slide projectors (all-sky and insert)- installed 2002 (removed July 2005)
  - f. Zeiss Mark VIII TD Universarium Star Projector - installed 2000
  - g. AVI Laser projector- installed 2001

**Upgraded Planetarium System Installed per Award No. FA9550-04-1-0237**

- 1) 6 Channel SEOS Integrated Full-dome video system
  - a. 6 Channel Projection Design F3 Single Chip DLP SXGA+ Projection System
  - b. 6 Channel SEOS OptiBlend Blending with Digital Color Correction
  - c. 6 Channel Chameleon with Scorpion real-time System. Capacity for 2x6 node cluster
  - d. 6 Channel Odyssey & Quest Projection Alignment System
  - e. AMX Theater Control System
  - f. Full-dome Dual Navigator Reference Alignment System
- 2) Cove Lighting System
  - a. Color Kinetics I-Cove LED lighting, 16 bit
- 3) Interactive Control and Polling System
  - a. IML Interactive Voting System (241 handsets + charging station)
- 4) 6 Channel Sky-Skan Full-dome video backend
  - a. 6 Channel Sky-Skan Digital Sky Planetarium Software
  - b. SPICE Control Automation Software
- 5) Secondary PC Cluster
  - a. 6 Node PC Cluster
  - b. Audio PC
  - c. Master Control PC with Genlock and Swaplock
- 6) Delta License
  - a. 6 Node Delta License for Playback
  - b. 1 node Delta License for Show Creation and Editing
- 7) Legacy Equipment Control Programming
  - a. Control for Zeiss Mark VIII TD Universarium Star Projector
  - b. Control for 6 ETC Source Four Ellipsoidal Lighting Instruments

- c. Control for 2 Pioneer V7400 DVD Players
  - d. Control for 1 Panasonic AG5710 S-VHS Video Player
  - e. Control for 1 Yamaha 01V 16x8 Auto Mixer
- 8) Lighting Control System
- a. 1 Strand 200 series 12/24 DMX Lighting Console